CLAIMS

What is claimed is:

1   1.   A computer system comprising:

2   a central processing unit (CPU); and

3   a cache memory, coupled to the CPU, including:

4   a main cache having a plurality of cache lines that are compressible

5   to store additional data; and

6   a plurality of storage pools to hold a segment of the additional data

7   for one or more of the plurality of cache lines that are to be compressed.

1   2.   The computer system of claim 1 wherein each of the plurality of storage

2   pools include a plurality of fixed width storage fields.

1   3.   The computer system of claim 1 wherein the plurality of cache lines are

2   included within a plurality of sets.

1   4.   The computer system of claim 3 wherein a storage pool is allocated to

2   each of the plurality of sets.

1   5.   The computer system of claim 4 wherein an indicator is associated with

2   each storage field of a storage pool to indicate a line within one of the plurality of

3   sets to which a storage field is assigned.

1   6.   The computer system of claim 3 wherein multiple storage fields within

2   each storage pool is allocated a within one of the plurality of sets.

1   7.   The computer system of claim 6 wherein each storage field mapped to one

2   of the plurality of sets is sorted according to a logical ordering.

1   8.   The computer system of claim 3 wherein a storage pool is shared by two

2   or more of the plurality of sets.

1   9.   The computer system of claim 8 wherein an indicator is associated with

2   each line of a storage pool to indicate which of the plurality of sets to which a

3   storage field is assigned.

1   10.   The computer system of claim 1 further comprising a cache controller

2   coupled to the cache memory.

1   11.   The computer system of claim 10 wherein the cache controller accesses the

2   cache lines and storage pools in parallel.

1   12.   The computer system of claim 11 wherein accessing the cache lines and

2   storage pools in parallel comprises the cache controller simultaneously

3   dispatching set bits to the cache lines and storage pools.

1   13.   The computer system of claim 11 wherein the cache controller accesses the

2   cache lines and storage pools serially.

1   14.   The computer system of claim 3 wherein a storage pool is shared by all of

2   the plurality of sets.

1   15.   A cache memory comprising:

2   a main cache having a plurality of cache lines that are compressible

3   to store additional data; and

4   a plurality of storage pools to hold a segment of the additional data

5   for one or more of the plurality of cache lines that are to be compressed.

1   16.   The cache memory of claim 15 wherein each of the plurality of storage

2   pools include a plurality of fixed width storage fields.

1   17.   The cache memory of claim 15 wherein the plurality of cache lines are

2   included within a plurality of sets.

1   18.   The cache memory of claim 17 wherein a storage pool is allocated to each

2   of the plurality of sets.

1   19.   The cache memory of claim 18 wherein an indicator is associated with

2   each storage field of a storage pool to indicate a line within one of the plurality of

3   sets to which a storage field is assigned.

1   20.   The cache memory of claim 17 wherein multiple storage fields within each

2   storage pool is allocated a line within one of the plurality of sets.

1   21.   The cache memory of claim 17 wherein a storage pool is shared by two or

2   more of the plurality of sets.

1   22.   The cache memory of claim 21 wherein an indicator is associated with

2   each line of a storage pool to indicate which of the plurality of sets to which a

3   storage field is assigned.

1   23.   The cache memory of claim 17 wherein a storage pool is shared by all of

2   the plurality of sets.

1   24.   A method comprising:

2   compressing one or more of a plurality of cache lines to store additional

3   data by:

4   storing a first component of the data in a main cache; and

5   storing a second component of the data in one or more of a

6   plurality of storage pools.

1   25.   The method of claim 24 wherein the plurality of cache lines are included

2   within a plurality of sets.

1   26.   The method of claim 25 further comprising allocating a storage pool to

2   each of the plurality of sets.

1   27.   The method of claim 26 further comprising associating an indicator with

2   each storage field of a storage pool to indicate a line within one of the plurality of

3   sets to which a storage field is assigned.

1   28.   The method of claim 25 further comprising allocating a storage pool to a

2   line within one of the plurality of sets.

1   29.   The method of claim 28 further comprising mapping each storage field to

2   one of the plurality of sets.

1   30.   The method of claim 29 further comprising associating an indicator with

2   each line of a storage pool to indicate which of the plurality of sets to which a

3   storage field is assigned.

1   31.   A computer system comprising:

2   a central processing unit (CPU); and

3   a cache memory, coupled to the CPU, including:

4   a main cache having a plurality of cache lines that are compressible

5   to store additional data; and

6   a plurality of storage pools to hold a segment of the additional data

7   for one or more of the plurality of cache lines that are to be compressed;

8   and

9   a main memory device coupled to the CPU.

1 32. The computer system of claim 31 wherein each of the plurality of storage

2 pools include a plurality of fixed width storage fields.

1 33. The computer system of claim 31 wherein the plurality of cache lines are

2 included within a plurality of sets.